Commonwealth of Kentucky
Division for Air Quality

PERMIT STATEMENT OF BASIS

TITLE V OPERATING PERMIT NUMBER V-05-055R2
TVA-MARSHALL COUNTY GENERATING STATION.
6264 INDUSTRIAL PARKWAY, CALVERT CITY, KY 42029.
JUNE 26, 2007
BEN MARKIN, REVIEWER
SOURCE I.D #: 021-157-00053
SOURCE AI#: 39146
ACTIVITY #: APE20070002

CURRENT PERMITTING ACTION: V-05-055R2

TVA-Marshall County Generating Station, formerly KGEN Marshall County Generating Station submitted a minor revision application on June 11, 2007 for the combustion turbine at their facility at Calvert City, Kentucky. The modification includes clarification for the startup, shutdown, and fuel switching conditions, which were not elaborated in the renewal and the revised permits. Under the operating limitations:

1. *Elapsed time for startup or shut down for each turbine shall not exceed two (2) hours.*

2 *Each combustion turbine cycles of startup and shutdown shall not exceed two (200) hundred times per calendar year or twelve (12) consecutive months total*

3. *A period of fuel switching shall begin when a combustion turbine initiates a decrease in load to accommodate the fuel switch and shall conclude after fifteen (15) minutes.*

4. *The permittee shall be limited to no more than four (4) fuel switching events per combustion turbine in any twenty (24) four period (daily), with each day period beginning at midnight and ending at 11:59 PM of the same calendar day.*

Additionally, fuel switching has been added to conditions for emission limitation to reflect the operating status of the facility. The clarification does not change the current emission limit; affect the established BACT limits or change the source wide emissions. But give the facility the flexibility to operate the combustion turbines.

PAST PERMITTING ACTIONS:

ADMINISTRATIVE AMENDMENT: V-05-055R1

The Division received an application for a change of ownership from GE Electric and Duke North America, LLC to Tennessee Valley Authority on December 27, 2006. Pursuant to 401 KAR 52: 020, Section 13, this modification is an administrative change which does not warrant a significant revision. However, the permit number has been revised to reflect the change

RENEWAL: V-05-055

The KGen Marshall County Generating Station operates eight (8) General Electric 7EA natural gas-fired turbines rated 1192 MMBtu/hr with an output capacity of 80 megawatts (MW) each. The plant produces electricity during periods of peak electricity demand on a daily and seasonal basis, and is

limited to operating 2500 hours per year or less for each unit. The plant does not belong to one of the 28 major source categories listed in 401 KAR 51:017, Prevention of Significant Deterioration (PSD) of air quality, because the gas turbines will be used without heat recovery. Simple cycle peaking units have been determined to fall outside of the 28 major source category list. The potential emissions of nitrogen oxides (NO_x) and carbon monoxide (CO) from this plant are more than 250 tons per year, and potential emissions of sulfur dioxide (SO_2), particulate (PM), and particulate-10 (PM-10) are in excess of the significant net emission rates as presented in 401 KAR 51:001, Section 1. The initial permit for the facility was reviewed under the provisions of the PSD regulation for all these pollutants and for HAP (Formaldehyde). The source is located in a county classified as "attainment" or "unclassified" for each of these pollutants pursuant to 401 KAR 51:010, Attainment status designations.

The new Title V permit will include a renewal of the Phase II Acid Rain Permit and the NO_x Budget Permit.

The facility also operates an emergency diesel pump rated 1.8 mmBtu/hr, and four (4) low sulfur fuel oil storage tanks of 519,000 gallons capacity with 9,000,000 gallons per year throughputs each is classified insignificant activity.

APPLICABLE REGULATIONS:

401 KAR 51:017	Prevention of significant deterioration of air quality.
401 KAR 51:160,	NO_x requirements for large utility and industrial boilers
401 KAR 52:060	Acid Rain Permits;
401 KAR 60:005, Section 3(ii)	Incorporating by reference 40 CFR 60, Subpart GG;
40 CFR 60, Subpart GG	Standards of Performance for Stationary Gas Turbines, for emission units with a heat input equal to or greater than 10 MMBtu/hr for which construction commenced after October 3, 1977;
40 CFR 60, Subpart A	General Provisions
40 CFR Part 75	Continuous Emission Monitoring (CEM)
40 CFR Part 64	Compliance Assurance Monitoring

401 KAR 51:160 (40 CFR Part 96) .The NO_x Budget Permit application for the combustion turbines was submitted to the Division, and received on February 02, 2004. Requirements contained in that application were incorporated into and made part of the NO_x Budget Permit. Pursuant to 401 KAR 52:020, Section 3, the source shall operate in compliance with those requirements.

401 KAR 52:060, Acid rain permits, applies to the combustion turbines and incorporates by reference the federal acid rain provisions as codified in 40 CFR Parts 72 to 78. The units do not have a NOx limit set by 40 CFR, Part 76.since Part 76 is not applicable to combustion turbines. The units also do not have SO_2 allowances per 40 CFR, Part 73.10 for each year from 2000 to year 2009.

Pursuant to 401 KAR 51:017, Prevention of Significant Deterioration (PSD) of Air Quality, while firing natural gas, nitrogen oxides emission levels in the exhaust gas shall not exceed an hourly average of 12 ppm by volume at 15 percent oxygen on a dry basis, and an annual (12 month rolling) average of 9 ppm by volume at 15 percent oxygen on a dry basis, except during periods of startup, shutdown, or malfunction. Continuous compliance with this limit shall be demonstrated by a continuous emission monitoring (CEM).

Pursuant to 401 KAR 51:017, while firing low sulfur diesel fuel, nitrogen oxides emission levels in the exhaust gas shall not exceed an hourly average of 42 ppm by volume at 15% oxygen on a dry basis, except during periods of startup, shutdown, or malfunction. Continuous compliance with this limit shall be demonstrated by a continuous emission monitoring (CEM).

Pursuant to 401 KAR 51:017, the fuel sulfur content due to the firing of natural gas shall not exceed 2.0 grains/1000 SCF.

Pursuant to 401 KAR 51:017, the fuel sulfur content of low sulfur diesel fuel shall not exceed 0.05% sulfur by weight.

Pursuant to 401 KAR 51:017, except during periods of startup, shutdown, or malfunction, the carbon monoxide emission level in the exhaust gas shall not exceed 25 ppm by volume at 15 % oxygen, on a dry basis, during any 3-hour average period while firing natural gas. Continuous compliance with this limit shall be demonstrated by a continuous emission monitoring (CEM).

Pursuant to 401 KAR 51:017, except during periods of startup, shutdown, or malfunction, the carbon monoxide level in the exhaust gas shall not exceed 20 ppm by volume at 15 % oxygen, on a dry basis, during any 3-hour average period while firing low sulfur diesel fuel oil. Continuous compliance with this limit shall be demonstrated by a continuous emission monitoring (CEM).
Pursuant to 401 KAR 51:017, while firing natural gas, particulate emissions shall not exceed 10 pounds per hour, based on a (3) three-hour average.

Pursuant to 401 KAR 51:017, while firing low sulfur diesel fuel, particulate emissions shall not exceed 26 pounds per hour, based on a (3) three-hour average.

Hazardous air pollutant (HAP) emissions are estimated to be less than 10 tons/year of a single HAP, and less than 25 tons/year of any combination of HAPs, based on the limitations necessary to maintain the emissions caps for nitrogen oxides and carbon monoxide for 2500 hours of operation, for each turbines.

The permittee has completed all initial performance tests required by 40 CFR 60, standards of performance for new stationary sources (NSPS) while burning natural gas. The turbines have not been operated to maximum capacity

To meet the monitoring requirements of 40 CFR 60.334, the permittee may install, certify, maintain and operate continuous emissions monitors to demonstrate compliance with emission limitations. NOx continuous emission monitors shall also be employed to meet the Compliance Assurance Monitoring requirements of 40 CFR 64.

Pursuant to 40 CFR 75 and 40 CFR 60.334, for which a fuel-monitoring schedule has been approved, the owner or operator may continue monitoring on this schedule. Nitrogen Oxides continuous emission monitor (CEM), may be used in lieu of the water fuel ratio monitoring system. The permittee shall monitor the downtime of the CEM during any unit's operating hour in which steam is injected into the turbine. Reports of the monitoring shall include the average steam or water to fuel ratio, average fuel consumption, ambient conditions (temperature, pressure, and humidity), gas turbine load, and (if applicable) the nitrogen content of the fuel during each excess emission. According to the current custom monitoring schedule, the sulfur content of the fuel shall be determined twice per annum. This monitoring shall be conducted during the first and third quarters of each calendar year.

For compliance with the hourly rate limit on the combustion turbines and the type of fuel fired in the turbine, the permittee shall monitor and record the hours of operation and the usage rate and type of fuel from each combustion turbine. The permittee shall monitor, record, and report all applicable requirements for each unit, pursuant to 40 CFR 60, Subpart GG.

OPERATIONAL FLEXIBILITY: N/A

EMISSION AND OPERATING CAPS DESCRIPTION:

a) The Permittee shall limit the operation of each combustion turbine such that the maximum total annual (12-month rolling average) hours shall not exceed 2500 hours per unit. [Self-imposed restriction pursuant to 401 KAR 51:017]

b) The Permittee shall limit operation of each combustion turbine while firing low sulfur diesel fuel such that the maximum total annual (12-month rolling average) hours is 500 hours or less. [Self-imposed restriction]

c) The Permittee shall not operate any combustion turbine, while firing diesel fuel, for more than 16 hours in any consecutive 24-hour period.

d) The Permittee shall not operate any combustion turbine below 60 percent load, except during periods of startup and shutdown.

REGULATIONS NOT APPLICABLE:

40 CFR Part 63 Subpart YYYY – National Emission Standards for Hazardous Air Pollutants for Stationary Combustion Turbines, does not apply to the source. The combustion turbines are existing units, as defined by 40 CFR Part 63 Subpart YYYY and do not have to meet the requirements of 40 CFR Part 63 and subpart A of 40 CFR Part 63.

CREDIBLE EVIDENCE:

This permit contains provisions that require specific test methods, monitoring or recordkeeping be used as a demonstration of compliance with permit limits. On February 24, 1997, the U.S. EPA promulgated revisions to the following federal regulations: 40 CFR Part 51, Sec. 51.212; 40 CFR Part 52, Sec. 52.12; 40 CFR Part 52, Sec. 52.30; 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12, that allow the use of credible evidence to establish compliance with applicable

requirements. At the issuance of this permit, Kentucky has only adopted the provisions of 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12 into its air quality regulations.